

**Final Report**  
Task Order No. 24  
Contract no. PCE-I-00-96-00002-00

**Romania Environmental Policy and  
Institutional Restructuring**

**USAID/Romania**

August 2000

# Chapter 1

## Introduction

During the period, 1994-1998, the Harvard Institute for International Development (HIID) implemented a policy advisory program in Romania as a component of the USAID-funded cooperative agreement titled “Central and Eastern Europe Environmental Economics and Policy (C4EP) Project.” The C4EP project in Romania, in partnership with the Council of Coordination, Strategy and Economic Reform, Ministry of Privatization, Ministry of Water, Forests, and Environmental Protection, and Romanian Automobile Registry provided technical assistance on a broad spectrum of environmental policy and finance issues.

When the C4EP Project ended on September 30, 1998, USAID indicated its interest in continuing the policy program for an additional year and requested the EPIQ consortium to field a resident team, supported by foreign experts.

This report summarizes the activities that the EPIQ consortium carried out in Romania under the “Environmental Policy and Institutional Restructuring Project. The activities described in subsequent chapters span a period of sixteen (16) months. The initial task order covered a one-year period (October 1, 1998 – September 30, 1999) but was extended by four months following Epic’s request for two no-cost extensions of two months each.

The next chapter provides an overview of the project including organization of the team, cooperation with Romanian counterparts, the work plan process, and introduces the substantive activities undertaken by the project team. **Chapters 3 through 5** describe the activities carried out by the team under the task order. They are grouped into three categories: development of legislation and regulation (**Chapter 3**), institutional restructuring and capacity building (**Chapter 4**) and economic instruments (**Chapter 5**). **Chapter 6** provides concluding remarks on the project’s achievements and identifies potential follow-up activities that would ensure that the team’s efforts yield the maximum benefits possible in implementation.

The final report also includes six annexes. **Annex 1** provides the USAID Task Order. **Annex 2** provides a list of all the experts that participated in the activities. **Annex 3** and **Annex 4** include lists of the members of the inter-ministerial working groups and lists of workshops and seminars, respectively. **Annex 5** present the work plan. All monthly and quarterly reports, papers and other documents (most are in both English and Romania), and copies of seminar presentations are available from HIID. (A complete list of available documents is provided in **Annex 6**.

## Chapter 2

### Project Overview

#### 2.1 Organization of the Project Team

To carry out the activities specified in the Task Order, HIID, a subcontractor to the EPIQ prime contractor, International Resources Group (IRG) assumed lead responsibility for the EPIQ consortium in organizing the project team. During project start-up, HIID was responsible for recruiting the local and foreign team of experts, organizing the local office, and developing the work plan. Throughout the project, HIID also provided logistical and administrative support for the Bucharest office and foreign experts from its office in Cambridge, MA.

Under C4EP, the HIID team in Romania had been headed by an U.S. advisor, Dr. Clifford Zinnes, supported by a local experts and administrative staff. As part of USAID's effort to build and sustain local capacity in environmental policy advising, it was decided that a team of Romanian experts would form the nucleus of the project team, with Dr. Vladimir Rojanschi serving as local project director. In addition to Dr. Rojanschi, the local project team members included:

Ms. Marilena Patrascu	Environmental Policy Expert
Ms. Mihaela Popovici	Water Resources Management Expert
Dr. Victor Platon	Environmental Economist
Ms. Rodica Stefanescu	Project Administrator
Mr. Adrian Saru	Project Assistant (10/98 – 8/99)
Ms. Carmen Constantin	Project Assistant (8/99 – 12/00)

The local project team was complemented by a number of foreign and Romanian experts. A list of consultants for each activity is provided in **Annex 2**. Both HIID and IRG played a role in providing management oversight. Dr. Zinnes and Dr. Theodore Panayotou of HIID in Cambridge guided the project team through the development and revision of the work plan. During the second half of the project, IRG also worked closely with the project team, with Dr. Glen Anderson assuming oversight responsibility for the technical program.

#### 2.2 Cooperation with Counterparts

The principal partner for the EPIQ project was the Ministry of Water, Forests, and Environmental Protection (MWFEP). Within the MWFEP, the team worked most closely with the Water Department and the Environmental Protection Department. For selected activities, the project team also worked closely with other counterparts. For example, Apele Romane (the Romanian National Water Company) participated in activities related to water tariffs. Other ministries and government agencies and institutions participated in the various inter-ministerial working groups. A list of members in the inter-ministerial working groups is provided in **Annex 3**.

To facilitate closer cooperation with counterparts, the local project team was located in an office provided by MWFEP. Counterparts were involved throughout all stages of the project. Ministry staff reviewed the work plan and provided comments. Project team members met on a regular basis with staff in the ministry during the preparation of documents and papers. Additional stakeholders participated in a series of seminars at which project draft documents and papers were presented. Comments were solicited from seminar participants and incorporated into revised versions of documents and papers. In some cases, documents such as legislation, regulations, and ministerial orders went through several revisions. A list of workshops and seminars is provided in **Annex 4**.

## 2.3 Work Plan Process

The EPIQ Project Team prepared and submitted a draft work plan to USAID and MWFEP for their review in November 1998. The draft work plan included twenty-two proposed activities (**Annex 5**). All but three of these activities represented a continuation of support HIID had provided under C4EP.

The work plan was not revised until the 1999 spring, as a result of personnel changes in USAID Romania and restructuring of the Ministry that delayed the review process. During this hiatus, the EPIQ project team initiated work on some topics that were later eliminated from the work plan. In some cases, these tasks were substantially completed before the decision was taken to remove them from the work plan and are described in subsequent chapters of this report

In March 1999, the work plan was revised and finalized in response to comments from USAID and MWFEP. The work plan was streamlined as a result of eliminating or scaling back twelve proposed activities in the final draft of the work plan. Two additional activities – preparation of the draft framework Waste Law and recycling of used oil – were added at the request of MWFEP. The final work plan included ten topics.

At the request of USAID, the final version of the work plan was expanded to elaborate on five issues related to each activity:

- (1) *High-level results* each activity was expected to achieve;
- (2) *Linkages* to ongoing activities and decisions in the counterpart ministry or agency;
- (3) *Counterparts* for each proposed activity;
- (4) *Critical assumptions* that were expected to affect the success of the activity; and
- (5) *Potential impediments* that the team would need to address or overcome in carrying out the proposed activity.

Table 2.1 provides a list of the activities included in the draft and final work plans. Activities included in the final work plan are referred to by their code in the final work plan and their draft code in parentheses).

**Table 2.1 – Proposed Work Plan Activities**

Code	Activities in Final Work Plan	Code	Activities Removed from Final Work Plan
NW1	Water tariffs (W1)	W2	Self-financing in the water sector
NEP1	Self-financing of local EPAs (E1)	W3	Regulations and manual development for River Basin Committees
NEP4	PCB Legislation (E11)	E2	Methodologies for tariffs for permitting and privatization services*
NEP5	Drafting of Waste Law	E3	Government decision on financial incentives for local EPA staff*
NEP6	Technical norms for remediation of contaminated soil and groundwater (E7,E8)	E4	Methodologies for tariffs for the environmental expert certification program
NEP7	Asbestos legislation (E10)	E5	Methodologies to establish revenue instruments for a national environmental fund
NEP8	Phase-out of sulfur in fuels (E13)	E6	Draft emergency order on liabilities for environmental damages
NEP9	Recycling of batteries (E15)	E9	Development of national inventory of contaminated sites
NEP10	Recycling of scrap tires (E16)	E12	Government decision on elimination of lead in gasoline
NEP11	Recycling of used oil	E14	Disclosure requirements for environmental information
		E17	Ministerial order on compliance schedules
		E18	Ministerial order on use of EIAs
		E19	Ministerial order on environmental permitting

\* Some elements of the removed activities were incorporated into NEP1.

## 2.4 Summary of Substantive Activities

The assistance program carried out by the EPIQ project team concerned three principles types of activities. One thrust of the work focused on the development of legislation and regulation required to harmonize Romanian law with European Union legislation and directives. The EPIQ team assisted in preparing a draft framework law for waste and regulations for specific waste streams; asbestos and polychlorobiphenyl (PCBs). In addition, the team developed regulations for remediation of contaminated soil and groundwater.

The second focus of the work related to the restructuring and strengthening of institutions and institutional capacity. The restructuring of the water sector was one of the major targets. However, although the initial work plan called for work on development of river basin committee capabilities, the water sector activities were principally related to the development of a methodology for restructuring water tariffs. Another target involved the problem of maintaining and expanding the capacity of local Environmental Protection Authorities (EPAs) to execute their responsibilities for permitting, inspections, and enforcement. This activity focused on establishing a system of tariffs for permitting that would enable EPAs to “self-finance” the costs of these environmental management functions. The third component of

these institutional strengthening activities pertained to revisions to the ministry's permitting procedures. These activities (E17-19 in Table 2.1) were deleted from the final work plan.

The third focus of EPIQ activities was on the use of economic instruments to manage selected environmental pollution problems. Principle targets included air pollutants in fuel (sulfur in diesel, heating oil, and coal; lead in gasoline) and solid waste disposal problems (batteries, used oil, and tires). The use of taxes on the air pollutant or pollutant-containing fuel were the major options consider to address sulfur and lead. For the three waste products, the team examined the use of deposit-refund schemes to ensure these wastes could be properly treated.

## **Chapter 3**

### **Legislation and Regulation**

#### **3.1 Waste Law**

##### **Background**

The reasons to select the waste sector for the development of a new legislation, were, as follows:

- major importance in Romania of the environmental problems caused by uncontrolled waste management;
- Romanian legislation on waste is not well conceived, nor complete; the gaps analysis performed within EU funded projects revealed that the Romanian legislation does not comply with the requirements of European Union on waste management and, moreover, so far there is no policy or strategy document for waste;
- also, the waste management has been identified as one of the priority sectors for development, due to the major environmental problems that need an urgent solution in Romania.

For these reasons, the waste sector was the target of a previous PHARE programme in 1996, when the first draft law on waste regime was proposed. From then, other pieces of legislation transposing EU directives subsequent to the framework directive have been promoted.

##### **Approach**

The existing draft Waste Law was reviewed and revised by the EPIQ team and discussed during a meeting of the inter-ministerial working group (IMWG) on June 28. At the same meeting, the EPIQ team also presented a plan for transposing EU legislation for the waste sector that had prepared for MWFEP. These documents were revised on the basis of comments received by EPIQ from IMWG members. The final version was presented to the Directorate for Strategy, Policies and Legislation in mid-July.

##### **Methodology**

The methodology proposed for transposition is based on the structure of European Union legislation on waste and on the gaps analysis comparing Romanian and European Union legislation. Apart from the legislation, declarative documents of Community principles and policies have been analyzed. In view of approximation of waste-related legislation and compliance with the environmental *Acquis*, Romania will have to adopt legislative measures using the same definitions, principles, objectives and conditionalities that were established by the EC waste legislation. Moreover, Romania will have to structure waste management policies to follow the basic guidelines.

A program of transposition Directive by Directive would raise the risk that both the definitions and the principles might be interpreted in accordance with the specific objective established by each individual directive. Such an approach might generate contradictions and inconsequence.

Consequently, the methodology developed a transposition plan in three parts based on identifying the basic elements of EC waste legislation to facilitate a horizontal approach to waste management issues in the spirit of European Union legislation. The plan will also provide the relevant legal information for progressive approximation, starting with framework legislation on waste and avoiding eventual contradictions among legal provisions.

**PART I** contains a general presentation of EC legislation, divided into 3 distinct groups (A, B, and C). EC legislation was reviewed Directive by Directive. Each Directive in the three groups was followed by a summary of conclusions on the differences between waste legislation in the EC and in Romania. In the first part, a vertical analysis has been provided that identifies the basic waste management elements.

EU Legislation reviewed for selection

1. **Group A** contains the framework legislation providing definitions, objectives, principles and conditions that apply to the environmental Acquis as a whole, included in:

- Directive 75/442 EEC on waste management, modified by Directive 91/156 EEC;
- Directive 91/156 EEC on hazardous waste implemented by Council Decision 94/904 establishing the "European Hazardous Waste List;" and
- Regulation EEC 259/93 on supervision and control of waste shipment within, into and from the EC.

2. **Group B** contains the legislation on operational requirements for waste treatment and disposal facilities, included in:

- a) Directives:
  - Directives on waste incineration
  - Directives 89/369 EEC and 89/429 EEC on domestic waste incineration in new and existing installations
  - Directive 94/67 EC on the incineration of hazardous waste
- b) Declarative Documents:
  - European Commission Proposal for a land filling Directive (COM 97/105). (Common Position of the Council of Ministers for the adoption of a Directive - March 23, 1998)

3. **Group C** consists of legislation on special waste flows, such as waste oils, waste from the titanium dioxide industry, batteries, sewer sludge, waste containing PCB/PCT, packaging and packaging waste. This legislation is included in:



- Directive 87/101 EEC, amending Directive 75/439 EEC on waste oil disposal (“Waste Oil Directive”)
- Directives 78/176 EEC and 82/883 EEC on titanium dioxide waste
- Directive 86/278 EEC on environmental protection, especially soil, if sewer sludge is used in agriculture (“Sewer Sludge Directive”)
- Directive 91/157 EEC on batteries containing hazardous substances
- Directive 94/62 EC on packaging and packaging waste
- Directive 96/59 EC on PCB and PCT disposal

**PART II** provides an analytical comparison of the two legislative structures from the point of view of basic waste management elements. This second analysis also provides the legal information for developing a horizontal analysis of waste management.

The review of CEE legislation on waste concludes with the identification of the following basic waste management elements, as follows:

- definition of waste;
- establishing waste categories and waste classification by characteristics or origin;
- hierarchy of waste management options;
- general European Union policy principles and CE legislation on waste management: the use of environmentally friendly processes and methods, the polluter pays principle, producer responsibility and proximity principles;
- waste management planning;
- waste collection;
- designation and role of the competent authority;
- permitting procedures for waste treatment and waste disposal facility operations;
- information systems for waste management control and monitoring;
- legislation enforcement and sanctions.

This analysis also includes waste definitions, the establishment of waste categories and classification, as these are the starting point in transposing Romanian law to achieve full compliance with EC legislation on waste. The other basic elements developed together in this chapter are devoted to general principles, objectives and conditions for waste management.

**PART III.** Based on the results of the horizontal and vertical analyses, this part addresses the issue of setting criteria for evaluating priorities for transposition of EU legislation.

#### Criteria Used for Prioritization

In order to help candidate countries establish priorities, the Commission Communication of May 20, 1998, suggested the following criteria:

- Environmental priorities for the country, to be determined on the basis of a detailed assessment of the environmental situation existing in the Country;
- The legislative and administrative gaps which have to be filled in order to meet the *Acquis*;
- Cost implications of approximation.

Also relevant are the criteria proposed by the 1995 White Paper on “Preparation of the Associated Countries and Central and Eastern Europe for integration into the Internal Market of the Union” (COM (95)163), according to which priority should be given to:

- measures that establish the overall framework for more detailed legislation;
- measures that address fundamental principles;
- measures providing basic procedures which govern the sector concerned as well as measures that in one way or another are a precondition for the effective environmental protection in the sector.

#### Application of prioritization criteria

- Uncontrolled waste management is a critical problem in Romania. It deteriorates the environment and endangers human health. As a result, the development of environmentally sound practices for waste management is considered a key environmental priority in Romania.
- There are many legislative and administrative gaps to be filled in order to meet the *Acquis* : Romanian legislation does not comply with any of the Directives and the Regulation, which are part of the EC legislation on waste.
- The development of an integrated and adequate network of waste treatment and disposal facilities in Romania will entail major cost implications, notwithstanding the cost resulting from the development of collection and sorting systems as well as some substantial administrative costs to ensure an effective waste management control.
- Directive 75/442/EEC, Directive 91/689/EEC and Regulation 259/93/EEC provides the overall framework for more detailed legislation, addressing fundamental principles for waste management and providing basic procedures which govern the waste sector. As a result, those pieces of EC legislation provides measures that in one way or another are a precondition for the effective environmental protection in that sector.
- Taking account of the horizontal definition of waste concept and the general principles laid down by EC legislation, it is also a precondition to adopt national legislative measures for managing certain waste streams that are not governed by EC legislation such as, for example, the management of medical waste.
- The relevant Romanian legislation on waste is not based the same basic elements of waste required by the framework EC legislation on waste.
- The way the waste concept is defined in Romanian legislation fall far short of complying with the corresponding EC definition. In the context of approximation, it is rather difficult to reach the transposition targets with such different approaches.

## **Results**

### Identification of priorities for transposing EC legislation on waste

Following the results of the “vertical” and “horizontal” analysis, and according to the criteria suggested by the European Commission for prioritizing key priority areas and objectives, it is proposed to concentrate in priority on certain aspects of waste management in order to achieve properly and progressively the transposition process while taking into consideration the environmental priorities for Romania.

Five priority objectives have been identified for the waste sector :

- Clarification of definitions and terminology;
- Identification of hazardous waste for tracking their utilization and destination;
- Endorsement of general principles of waste management (hierarchy, proximity, polluter pays principles);
- Organization and rationalization of waste management operations, including collection and sorting systems, through the establishment of waste management plans;
- Adoption of procedures for controlling waste movements (trans-boundary and local) and transportation conditions;
- Adoption of technical requirements for disposal operations, more particularly for ensuring safe landfilling practices.

## **Conclusion**

The target was to transpose, as a first step, most of the requirements laid down by the framework EC legislation (Directives 75/442/EEC and 91/689/EEC, and to some extent Regulation 259/93/EEC) on waste as well as to introduce some technical requirements for ensuring safe disposal of waste (Regulation 259/93/EEC is not to be transposed into Romanian legislation by virtue of its direct applicability into national legal order. It will enter into force the day of accession.). The proposed draft fully achieved this target.

## **3.2 Asbestos**

### **Background**

The existing Romanian legislation is almost silent on the control of asbestos-related impacts, and is completely silent on the liabilities posed by asbestos-containing materials. In addition, it is believed that the laboratory capability for the analysis of asbestos in bulk samples or air samples is poor or non-existent in Romania.

This is most significant, since studies undertaken elsewhere in Europe have shown that asbestos exposure is the greatest source of occupation-related deaths. In response to this, the European Union has enacted a number of Directives which regulate the use of asbestos in new products and which control the release of asbestos fibers into the environment and the workplace. Romania needs to introduce legislation approximating the EU laws, and these should also provide indications of the treatment of asbestos-containing materials as liabilities in environmental audits.

The Environmental *Acquis* includes a number of Directives relating to the control of the impacts derived from the use of asbestos, specifically addressing the health-related effects of this mineral. These Directives were published mainly in the 1980s and early 1990s, and reflect the increasing concern amongst the EU Member States over the detrimental effects of the exposure of humans in particular to asbestos, in all its various forms.

The key items of asbestos legislation in the EU include:

- ◆ **Directive 83/477/EEC (as amended by Directive 91/382/EEC)**, both of which refer to activities where workers may be exposed to asbestos. These Directives place detailed requirements on employers, in order to minimize the occupational health effects of asbestos.
- ◆ **Directive 87/217/EEC**, which seeks to minimize pollution of the environment from activities involving asbestos. This Directive applies particularly to processes using more than 100kg of raw materials per year, and restricts emissions of asbestos to air, water or land. In addition, it requires that demolition projects minimize the release of asbestos to the atmosphere to the extent possible.
- ◆ **Directive 91/659/EEC**, which bans the marketing and use of almost all asbestos products, apart from certain products containing chrysotile. This Directive also places significant restrictions on the use of chrysotile, for a wide variety of purposes.

The EU legislation requires that a relatively simple form of risk assessment (termed here, an Exposure Risk Assessment) must be carried out before any activities involving asbestos are started. If it appears likely that atmospheric exposures will be above a given Threshold Value, the employer must:

- notify the 'regulatory authority' (competent authority, in Romania) of the work;
- reduce asbestos exposures to levels which are as low as possible;
- conduct air sampling to ensure that exposures are acceptable;
- ensure that waste asbestos is removed as quickly as possible and disposed of in an appropriate fashion;
- ensure that all staff understand the nature of the work, and possible risks; and
- provide Personal Protective Equipment in cases where a second higher exposure level to asbestos (known as the Limit Value) is exceeded.

The desire of the Romanian Government for accession to the EU implies a need to define a pathway for approximation in relation to the various requirements of the EU Directives.

## **Approach**

The EPIQ team, supported by consultant Dr. David Phillips, drafted a background options paper for discussion by the IMWG on June 14. This paper was revised based on comments. In addition, Dr. Phillips produced draft regulations for asbestos that were discussed at a subsequent meeting of the IMWG on July 23.

The Options Paper addresses the manner in which the requirements of the various EU Directives on asbestos should be subject to approximation in Romania. It is intended that new Romanian legislation will be drafted following the discussion of this Options Paper by the relevant authorities in Romania, and that the new legislation will approximate the requirements embodied by the existing EU Directives in this area.

The essential objective of the planned new Romanian legislation on asbestos is to derive and to closely define a pathway for the Romanian Government to approximate to the requirements of the relevant EU Directives on this topic. This will involve four key steps:

- ◆ the development of policies and strategies in relation to the Romanian reaction to the Directives and the need for their approximation;
- ◆ the transposition of the Directives into the national legislation;
- ◆ the implementation of the new national legislation on the topic; and
- ◆ the enforcement of the new Romanian legislation.

It was considered that a number of inter-linked elements must be addressed for these objectives to be achieved, and these were covered in the following sub-sections, after a brief synopsis of the key EU Directives on asbestos.

## **The Compounds to be covered**

The key EU Directives reviewed above cover six distinct forms of asbestos, as follows:

- actinolite - Chemical Abstract Service (CAS) No. 77536-66-4;
- amosite – CAS No. 12172-73-5;
- anthophyllite – CAS No. 77536-67-5;
- chrysotile – CAS No. 12001-29-5;
- crocidolite – CAS No. 12001-28-4; and
- tremolite – CAS No. 77536-68-6.

Previous work in Romania under the current project has established that chrysotile (white asbestos) is by far the most widely used form of the mineral nationally, followed by crocidolite (blue asbestos, utilized mainly in the manufacture of asbestos-cement pipes) and amosite (brown asbestos). The other three forms of the mineral listed in the EU legislation are utilized only sparingly in Romania. A decision is required as to which specific forms of the mineral to include in the new Romanian legislation.

### **The Mining of Asbestos Within Romania**

The mining of asbestos in Romania has been restricted historically to a single site. This mine acted as a source of low-grade chrysotile fiber, which is believed to have been used mainly as an additive to asphalt. It is understood that this mine is currently essentially inoperative and that stockpiles of the mined product are almost exhausted. No studies are known to have been completed on the health of the miners.

The asbestos fiber utilized presently in Romanian manufacturing processes is thus almost all imported at present, and is derived from a number of countries, including Canada; southern Africa (mainly Zimbabwe, Botswana and South Africa); Russia; and the United Kingdom. Once the controls proposed below have been introduced in Romania, the national rates of utilization of asbestos fiber are expected to decrease substantially.

### **Controls on Occupational Exposures to Asbestos**

This is the key area of concern in relation to the introduction of controls as a whole on the use and the effects of asbestos. It is noted that historical exposures of humans to asbestos are recognized as the greatest source of occupational death in western nations, and that the incidence of asbestos-related diseases is continuing to rise, even decades after the introduction of controls in these countries on the use of the mineral in industry. This is due to both: (i) the very long latency periods for the onset of each of the distinct forms of disease caused by exposure to the mineral; and (ii) the fact that workers in the refurbishment and demolition industries in particular have been exposed to asbestos long after its original industrial use in manufacturing.

There are a number of distinct issues, which must be addressed in Romania if the controls on occupational exposures to asbestos are to be upgraded to approximate those of the EU Directives.

### **The Forms of Asbestos Employed in Romania**

Chrysotile (white asbestos) is the most commonly utilized form of the mineral in Romania, by far. Amosite (brown asbestos) is used sparingly, minor amounts having been employed in the asbestos-cement industry and in the manufacturing of insulation. Crocidolite (blue asbestos) is in current use in the asbestos-cement industry and in the production of brake linings and certain other applications.

It has become widely recognized that amosite and crocidolite impose greater dangers to human health than chrysotile, and this is believed to be due principally to the length and form of the fibers of the

respective forms of the mineral. In response to this fact, Directive 83/478/EEC of the European Union severely restricted the marketing of products containing crocidolite (although the use of this form of asbestos in the production of asbestos-cement pipes and certain other manufactured products was excluded from the ban at that time). Directive 91/659/EEC then extended this to a total prohibition on all six forms of asbestos listed above, with the exception of chrysotile. This prohibition relates to “...the placing on the market and use of these fibers and of products containing these fibers intentionally added....” Directive 91/659/EEC also prohibited the use of chrysotile in a wide range of products (see below for details).

It is emphasized that the restrictions introduced by the EU related to the marketing and use of products containing asbestos in various forms, not specifically to their manufacture. This approach circumvents problems created when the manufacture of particular products is banned, but the products can simply be imported from elsewhere. This is of significance in Romania, which could import products containing asbestos from neighboring countries even subsequent to a ban on the manufacturing of such products nationally. It is considered that the intention of the new Romanian legislation should be to restrict the creation of further asbestos-related disease nationally, and the approach taken by the EU legislation should therefore be followed.

Following the ban on the marketing of products containing forms of asbestos other than chrysotile, further discussions have been held within the EU and in many of the individual Member States in relation to the ongoing impacts of asbestos on human health. The principal concerns are now two-fold, as follows:

- ◆ The continuing use of chrysotile has become controversial, and eight Member States have now unilaterally banned almost all industrial uses of chrysotile, although a similar response from the EU itself is still anticipated.
- ◆ Death rates caused by exposures to asbestos are continuing to increase in EU Member States and many other western nations, due to the very long latency periods of the disease and the ongoing exposures of workers engaged in non-manufacturing activities. The latter include in particular, workers in the refurbishment and demolition industries.

It appears most likely that the use of any form of asbestos in manufacturing will become subject to total prohibition within the EU in the relatively near future. Similarly, the permissible exposure levels for humans have decreased considerably during the last two decades in the EU and its Member States, and this trend appears likely to continue.

Decisions are required in Romania as to whether (and when) to prohibit the use of specific forms of asbestos. Options are available nationally in relation to a range of possible derogations for particular uses of specific types of asbestos fiber. In addition, different rates of the phasing-in of any prohibitions can be considered, at least within the period before Romania joins the EU. At the point of Romania's accession to the EU, however, it is most likely that the national legislation will be required to fully match

that of the EU. This may well imply a total prohibition on the use of asbestos, as it is likely that the EU will opt for such a ban in the relatively near future.

It is notable that the introduction of controls on exposures to forms of asbestos other than chrysotile are the most urgently-required, if improvements are to be made in relation to the current levels of adverse impacts of asbestos on human health.

### **The Triggering of Exposure Risk Assessments**

The EU legislation lays down a requirement for the completion of a particular form of risk assessment where exposures to asbestos fibers are considered to be likely to be above certain limits. This type of risk assessment is termed an Exposure Risk Assessment here, to distinguish it from the Risk Assessment mandated by Order 184/97 of the Romanian Ministry of Waters, Forests and Environmental Protection as a potential final phase in the environmental auditing procedures.

The requirements within the EU in this respect were originally included in Directive 83/477/EEC, but these were updated and strengthened by Directive 91/382/EEC, due to increasing concerns over the occupational effects of asbestos exposure. The latter Directive mandates the completion of an Exposure Risk Assessment where:

- The levels of chrysotile fibers in air are considered likely to exceed  $0.2 \text{ fibres/cm}^3$  in relation to an eight-hour reference period, or to exceed a cumulative dose of  $12.0 \text{ fibre-days/cm}^3$  over a three-month period; or
- The levels of fibers of other forms of asbestos in air (or of mixtures of fibers, which may or may not contain chrysotile) are considered likely to exceed  $0.1 \text{ fibres/cm}^3$  in relation to an eight-hour reference period, or to exceed a cumulative dose of  $6.0 \text{ fibre-days/cm}^3$  over a three-month period.

The EU legislation also includes a range of other requirements relating to Exposure Risk Assessments.

### **The restrictions included in Directive 91/659/EEC with respect to the use of chrysotile.**

A number of uses of chrysotile are prohibited including: toys; materials or preparations intended to be applied by spraying; finished products which are retailed to the public in powder form; items for smoking, such as tobacco pipes and cigarette or cigar holders; catalytic filters and insulation devices for incorporation in catalytic filters using liquefied gas; paints and varnishes; filters for liquids; road surfacing material where the fiber content is greater than 2%; mortars, protective coatings, fillers, sealants, jointing compounds, mastics, glues, decorative powders and finishes; insulating or soundproofing materials with a density less than  $1 \text{ g/cm}^3$ ; air filters, and filters used in the transport, distribution and utilization of natural gas and town gas; under lays for plastic floors and wall coverings; textiles finished in the form intended to be supplied to the end user, unless treated to avoid fiber release; and roofing felt.

### **The Registration of Contractors for Work Involving Asbestos**



The EU legislation does not specifically demand the establishment of a Registration System for companies undertaking refurbishment or demolition works. However, many of the EU Member States have taken this step, as this greatly improves their control over the activities of such contractors and the potential for exposures of their staff to unacceptable levels of asbestos. In most such instances, only Registered Contractors are permitted to work on projects where the levels of asbestos are likely to exceed the Threshold Values for notification, and these Contractors are required to train and equip their staff appropriately.

A decision is required as to the preferred approach within Romania on this matter. It is strongly recommended that the new legislation to be developed in Romania should require the establishment of a Registration System for contracting companies working on projects where asbestos may be encountered. This is because controls on the exposures of workers in the refurbishment and demolition industries are very hard to achieve if this approach is not taken.

### **The Limit Values in Romania for Occupational Exposures**

The existing Romanian legislation includes a maximum permissible exposure level for asbestos in air in occupational situations of 2 ML/ml. The permissible occupational exposure levels to asbestos in the EU legislation were laid down originally by Directive 83/477/EEC, and these were strengthened significantly by Directive 91/382/EEC. The latter Directive remains currently in force, and prescribes the following:

- A Limit Value for occupational exposures to chrysotile of 0.6 fibres/cm<sup>3</sup> in relation to an eight-hour reference period.
- A Limit Value for occupational exposures to mixtures of asbestos fibers (which may or may not include chrysotile) of 0.3 fibres/cm<sup>3</sup> in relation to an eight-hour reference period.

At levels of exposure above these Limit Values, the EU legislation mandates the use of Personal Protective Equipment. The equipment required varies according to the levels of asbestos exposure likely to be encountered. Further requirements also exist with respect to the containment of working areas, where fugitive dust emissions may impact outside these areas.

It appears likely that the EU may seek to reduce these exposure levels even further in the future, in order to attempt to improve the protection of human health. While debate continues over the effects of low chronic exposure levels, it is widely considered that there is no truly safe level of exposure to asbestos fibers.

In Romania, there is a need to reconsider the current levels of permissible exposure to asbestos fibers. It is known from studies elsewhere that the currently mandated permissible levels in Romania do not offer adequate levels of protection in occupational exposure situations. Approximation to the EU legislation will require the adoption nationally of the EU Limit Values for occupational exposures, and the only debate is thus related to the rate at which the EU Limit Values should be phased-in for use in

Romania. However, it is considered that there is little merit in sequentially decreasing the existing standards in Romania to eventually comply with those of the EU, as this would imply a need for several upgrades of the industrial processes and equipment, which would not be cost-effective.

### **The Occupational Health Protection Legislation in Romania**

The existing occupational health legislation in Romania mandates the following:

- ◆ higher levels of pay for workers exposed to levels of hazardous substances above the norms or standards included in the relevant national laws; and
- ◆ a shorter working life and hence an early retirement for workers in industries classified as being of a hazardous nature (including those exposed to asbestos).

Where exposures to hazardous substances in the workplace are significant, these two regulations interact with each other to exacerbate the adverse effects of such substances on occupational health. Thus, it is understood that workers in certain industries (including at least some of those using asbestos) deliberately expose themselves to hazardous substances in order to gain the higher levels of pay. Additionally, the policy relating to early retirement increases the rate at which individuals cycle through exposed workplaces, and hence exposes larger numbers of individuals to occupational hazards. Both of these regulations are therefore counter-productive, and neither reflects the general practices in EU Member States.

The continuation of practices of this nature would not comply with either the spirit or the content of the EU legislation on occupational exposures to hazardous substances. Thus, the EU legislation seeks to protect the health of workers through the imposition of controls on the employer.

### **Other Issues Relating to Occupational Health**

The EU legislation also contains a number of more detailed requirements, which relate to the protection of occupational health and the management of activities where asbestos is encountered. These include the following:

- a ban on the application of asbestos by spraying processes;
- a need to minimize exposures to asbestos through various activities, including adjustment of the processes used to reduce asbestos dust levels as far as possible;
- requirements for the interim storage and final disposal of asbestos-containing wastes;
- requirements for the monitoring of airborne fiber levels in situations where the Threshold Values are likely to be exceeded;
- the need for signs to be used where asbestos fiber levels exceed the Limit Values;
- requirements for specific facilities and equipment to be available to workers exposed to elevated levels of asbestos; and

- demands for all exposed workers to receive regular medical examinations, the form of these examinations, and the need to maintain records of the results of such medical surveillance.

## **Non-Occupational Exposures to Asbestos**

### **Emissions of Asbestos to Air or in Wastewaters**

The main requirements of the EU legislation with respect to non-occupational impacts derived from asbestos are found in Directive 87/217/EEC. It may be noted that non-occupational exposures to asbestos are not generally considered to be as important as occupational exposures, in relation to the overall numbers of deaths caused. However, non-occupational exposures to the mineral are nevertheless of significance, and there is a need to protect the general public as far as possible from any exposure to asbestos.

The most important potential exposure route to asbestos for the general public is through the inhalation of fibers (as is the case for occupational exposures), although Directive 87/217/EEC also addresses the potential exposure pathway through water. The key attributes of the EU legislation are as follows:

- ◆ The threshold for controls on the external impacts of activities involving asbestos is established by requiring controls over all mining, manufacturing and industrial activities employing greater than 100 kg of raw asbestos annually.
- ◆ The legislation mandates the control of asbestos emissions at source wherever this is possible, and for this purpose, use is required of “the best available technology not entailing excessive costs” (BATNEEC).
- ◆ A limit on asbestos levels in emissions to air is established, at  $0.1 \text{ mg/m}^3$ , although facilities emitting less than  $5,000 \text{ m}^3/\text{hour}$  of total gaseous discharges may be exempted from such controls.
- ◆ Aqueous effluents containing asbestos are required to be recycled where this is economically possible. Any wastewater, which is discharged, must contain less than 30 grams of total suspended matter/ $\text{m}^3$ , and controls are required over the volume of wastewater discharged per tonne of product.
- ◆ Where significant discharges of asbestos occur either to the atmosphere or in aqueous effluents, regular monitoring must be undertaken.
- ◆ The Directive specifically covers demolition work, and the minimization of dust emissions is mandated.
- ◆ All wastes containing asbestos must be transported and disposed of in such a fashion that asbestos fibers are not released.

Each of these requirements should be reflected in the new Romanian law concerning exposures to asbestos, if adequate approximation to the EU legislation is to be achieved. The inclusion of BATNEEC in the EU legislation is of particular interest, as this is a common concept in EU law and there will be a need for its introduction into the Romanian legislation on a number of topics.

### **The Labeling of Products Containing Asbestos**

The labeling of products containing asbestos is of considerable importance to the protection of the general public, and this issue is therefore covered in the present section concerned with non-occupational exposures to the mineral.

The principal requirements with respect to the labeling of asbestos-containing products are found in EU Directive 83/478/EEC, which constitutes an amendment to the earlier Directive 76/769/EEC. These include a requirement for the attachment of a label. A number of other more detailed requirements are also noted in the Directive, including the following:

- ◆ Where products contain crocidolite, the wording “contains asbestos” should be replaced with “contains crocidolite/blue asbestos”.
- ◆ Safety instructions should be included with products containing asbestos when the latter are sold. These instructions are to cover matters such as the preference for damping products to be drilled or cut, and the preference for the use of low-speed tools for drilling or sawing the products.

Concern exists in relation to the use of products containing asbestos in Romania, as this constitutes a source of exposure to the general population. For example, asbestos-cement sheeting and panels are likely to be drilled and cut by members of the public in their assembly for roofing or facades, and there is little understanding amongst the general public of the hazardous nature of such activities.

The proposals of Directive 83/478/EEC are therefore relevant to the Romanian situation, and the introduction of such requirements into national legislation in Romania would assist in protecting the general public from exposures to asbestos.

### **Capabilities for Monitoring, Sampling and Analysis**

The various EU Directives concerning asbestos and its effects contain a number of requirements for the monitoring of fiber levels. Monitoring activities are required by several parties, including the following:

- ◆ Operators of processes employing significant quantities of asbestos are required to monitor their discharges of fibers to both air and water, as noted above.
- ◆ Companies contracted to undertake refurbishment or demolition work on asbestos-containing materials are required to monitor the exposures of staff to fibers, and also to monitor releases of the mineral to the external environment.

- ◆ The regulatory authorities are expected to monitor occupational exposure levels, and ambient monitoring of fiber levels should also be undertaken where there is the possibility of significant exposure of the general public.

The monitoring requirements as a whole encompass a need for three types of analysis for asbestos. The first of these involve the bulk analysis of materials, to ascertain whether asbestos is present in these, and in what form and concentration. The second type of analysis is perhaps the most important, and involves the analysis of fiber levels in air. Finally, Directive 87/217/EEC also requires the monitoring of asbestos fiber levels in wastewaters.

In Romania, there is essentially no capability at present for the analysis of bulk materials for asbestos. It is believed also that wastewaters have not previously been monitored for fiber levels. However, the health authorities do monitor fiber levels in air at many of the manufacturing facilities utilizing raw asbestos fiber, and some studies of personal exposure levels to asbestos fibers have also been undertaken in the past, although most of these have been completed on an ad hoc basis.

There is a need for the upgrading of the current monitoring activities for asbestos in Romania, especially in relation to the capability to monitor occupational exposures to the mineral, and to analyze bulk materials for the presence of asbestos.

### **The Preferred Legislative Mechanisms**

The proposed legislation on asbestos in Romania covers a considerable range of issues, and extends from environmental matters, into issues regarding human health protection in general, and the protection of occupational health in particular. Some of the legislation required will be altogether new for Romania, whilst there will also be a need for the amendment of certain of the existing regulations.

Several options exist as to the preferred form of the legislation. The promulgation of separate Ministerial Orders (or perhaps, Common Orders in some cases) is not considered preferable, as this would give rise to fragmentation of the legislation and to potential confusion over the precise responsibilities and requirements. The preferred option was for a Decision of the Romanian Government.

### **Results**

The Government Decision on Asbestos was drafted. It had not been approved by the end of the Task Order (January 2000), since approval of the new Waste Law must precede the approval of the government decision. Both the Waste Law and the government decision were expected to be approved in the Year 2000.

### **3.3 PCBs**

## **Background**

Polychlorinated biphenyls (PCBs) are chemical compounds based on the biphenyl molecule, exhibiting a wide variety of possible chlorine substitution positions. In total, some 209 individual PCB compounds (known as "congeners") may exist, these differing only in the number and position of chlorination. Commercial PCBs, which were introduced for use in industrial applications in about 1921, constitute complex mixtures of congeners varying in their overall degree of chlorination.

While PCBs have mostly been utilized in dielectric fluids in electrical equipment (especially transformers and capacitors), their physicochemical properties are also suited for a variety of other applications. Thus, for example, PCBs have been used at various stages through the last 75 years in such diverse applications as heat transfer fluids in industry; in carbonless copying paper; in particular types of inks; and in building sealants.

In the late 1960s and early 1970s, marine scientists began to study compounds which interfered with the analytical determination of DDT and its metabolites, which had become notorious as environmental toxicants due largely to their impacts upon bird life. This eventually led to the discovery by Dr. Sören Jensen in Sweden of significant concentrations of PCBs in wildlife, from both terrestrial and aquatic environments. Further studies revealed that PCBs are not only highly toxic to a wide variety of life forms (including humans) but are also of exceptional persistence in the environment. They are transported through both the aquatic medium and the atmosphere, and may hence affect areas remote from anthropogenic influences (including the polar regions).

The most recent research has suggested that PCBs may be responsible (in whole or part) for a number of environmental effects, particularly in aquatic ecosystems. Thus, for example, PCBs have been documented to reduce reproductive success in a variety of fish and marine mammals, the latter including both seals and dolphins. It is probable that similar effects also occur in terrestrial environments. Under particular circumstances, PCBs may also produce dioxins, which are amongst the most toxic substances known.

## **Previous Legislation of Relevance**

Subsequent to the discovery of PCBs in wildlife throughout much of the world, concerns over the environmental effects of PCBs gave rise to restrictions or bans on their commercial production and some forms of their utilization in the late 1970s and 1980s, in much of the western world. However, the use of PCBs has continued to date in "closed applications" in many of the developed nations, and the compounds are still utilized heavily for many purposes in the developing countries. The Japanese scientist Dr. Shinsuke Tanabe has calculated that of the cumulative tonnage of PCBs produced globally to date, only some 4% has been lost or destroyed, the great majority of the tonnage being present either in the open environment or in ageing electrical equipment.

Legislation concerning PCBs has existed in each of the EU Member States for the last 10-20 years, and this has grown in stringency over that period. For example, in the United Kingdom the Department of

the Environment released a Waste Management Paper in the mid-1970s providing advice on the disposal of the compounds (this being revised in 1994). In the mid-1980s, bans were instigated on the sale of PCBs and on their use in new plant and equipment in most of Western Europe, following a European Union Directive. These bans involved some notable exceptions, however, including dielectric fluids in transformers and capacitors; hydraulic fluids used in mining equipment; and the fluids utilized in certain heat transfer applications.

In 1990, the United Kingdom joined a number of other nations bordering the North Sea in commitments made at the Third International North Sea Conference in the Hague, to phase out and destroy any identifiable PCBs *"by 1995 and by the end of 1999 at the latest"*. The Paris Commission extended this agreement to the North East Atlantic area in 1992, confirming the target date of the end of 1999 for the North Sea countries, and establishing a target date of 2010 for other countries, which do not border the North Sea but are a party to the Paris Convention.

### **The New European Union Directive**

Following the legislation discussed above and as a result of the continuing concerns over the effects of PCBs, the European Union (EU) has issued a Council Directive on their disposal (96/59/EC). This text will be provided to the Working Group in full, but a synthesis is provided here in Romanian to assist in the work of this Group.

The most important features of the EU Directive, which was first discussed in 1988 but was finalized only in autumn 1996, are as follows:

- ◆ The basic objective of the legislation is the complete elimination of PCBs within Member States, and also that of certain compounds with similar chemical characteristics (but which are much less widely used).
- ◆ Specifically, Member States are bound to take precautions *"to ensure that used PCBs are disposed of and PCBs and equipment containing PCBs are decontaminated and disposed of as soon as possible"*, and at the very latest by the year 2010 (Article 3).
- ◆ By 15 September 1999 (three years after the Directive was adopted), Member States are to compile inventories of equipment with PCB volumes of greater than 5 dm<sup>3</sup> (5 liters) and to submit these to the EU Commission. It is noted that the threshold volume is intended to include all the separate elements of capacitors, when these are present as a combined set. All equipment containing fluids with a PCB concentration of greater than 0.05% (500 parts per million) is to be included in full in the inventories produced.
- ◆ Equipment containing PCBs at concentrations between 0.005% and 0.05% may be used until the end of its useful life, but certain additional precautions are required (see below).

- ◆ By the same deadline, Member States are also required to draw up plans for the decommissioning and/or disposal of the inventoried equipment and the PCBs contained therein.
- ◆ All equipment included in the inventories must be labeled, as must the doors of buildings where such equipment is located. The general form of the labeling to be employed is included in the Directive.
- ◆ Parties disposing of PCBs must be subject to Permitting; must maintain registers of the quantity, origin, nature and content of the PCBs delivered to them for disposal; and must submit these to the competent authorities. The disposal of PCBs by incineration on board ships is prohibited, and incineration on land must comply with EU Directive 94/67/EC on the incineration of dangerous waste. Other methods of disposal are considered acceptable only if they achieve equivalent environmental safety standards to those embodied by Directive 94/67/EC.
- ◆ PCBs may not be separated from other substances for their re-use; in addition, the topping-up of transformers containing PCBs is prohibited. However, the retro filling of transformers (i.e. the complete replacement of PCB-containing fluids with alternatives) is permitted under the Directive. Where transformers are decontaminated, the PCB content must be reduced to less than 0.05% (and if possible, to less than 0.005%). Replacement fluids must be known to *"entail markedly lesser risks"* than the PCB-containing fluids.

## **Approach**

Draft legislation was prepared by Dr. David Phillips, then translated and presented during the IMWG meeting on June 18. The participants in the working group meeting expressed their appreciation for the flexible approach to the transposition of EU legislation on PCBs, adapted to the local conditions of implementation. The draft ensured the structures and measures needed for implementation, as well as for enforcement.

## **The Relevant Issues for Romania**

### ***The Scale of the Problem in Romania***

A number of questions are relevant to the scale of the problem faced by Romania in relation to PCBs and closely related compounds. The questions relate to various aspects of the historical and current utilization of PCB-containing materials in the electrical industry and elsewhere in Romania; and to the potential impacts of these. In addition, a specific question is included on the use of PCNs in the telecommunications industry in Romania.

### **The Compounds to be Included**

Different authorities have sought to cover distinct compounds or groups of compounds in the existing legislation relevant to PCBs. There was a need for a decision on the precise compounds to be covered



in the eventual Romanian legislation, to be addressed by the Working Group at an early stage, in order that the later work may be focused correctly on the compounds of importance.

In addition to PCBs, the possibilities are as follows:

- polychlorinated terphenyls (PCTs);
- polychlorinated naphthalenes (PCNs);
- polybrominated biphenyls;
- monomethyl-tetrachloro-diphenyl methane;
- monomethyl-dichloro-diphenyl methane; and
- monomethyl-dibromo-diphenyl methane.

### **The Need for a National Inventory**

One of the key aspects of the EU Directive is the inclusion of a requirement for an inventory of PCB-containing equipment. Minima are established for the volume of PCB-containing fluids (5 liters) and the PCB concentration of relevance (500 parts per million, or 0.05%).

The imposition of such a requirement in Romania would be useful in: (i) developing the preliminary information produced under item above; and (ii) providing further information on the locations and volumes of PCB-containing materials which will eventually require disposal.

It is proposed that Romania should complete an inventory with the same basic elements as that required by EU Directive 96/59/EC, and that this should be completed by the agreed deadline to provide sufficient time for the inventory to be completed in Romania.

Once this agreed, there was a need for the formulation of written materials on the topic, and probably also the passage of legislation requiring the completion of the inventory. The Working Group was invited to consider what form this legislation should take. It is decided that a Decision of the Government should be preferred.

### **Plans for the Decommissioning of Equipment and the Disposal of PCBs**

The EU Directive also calls for the preparation of plans for the decommissioning of equipment containing PCBs, which is included in the inventory, and this extends to plans for the disposal of the contaminants.

For EU Member States, this is a reasonable requirement (as routes for the disposal of PCBs exist nationally in many cases, or are available through the exportation of such wastes, at affordable costs). However, no adequate disposal facility exists currently in Romania.

As a result, it is believed that parties completing responses concerning the inventory in Romania will be unable to propose rational disposal routes for the PCB-containing materials. It is therefore suggested that this matter to be considered at a national level, rather than including any requirement for the preparation of decommissioning/disposal plans in the legislation to be produced on the inventory needs.

## **Labeling**

The EU Directive lays down a requirement for the labeling of equipment containing PCBs above the minimum concentrations of interest, and includes the general form of the labels to be employed.

It is proposed that this requirement could be included in the Romanian legislation demanding the completion of an inventory. This would require minor additions to the legislation on the inventory, including the provision of instructions on the form of the labels to be used. The use of a Romanian version of the labeling proposed in the EU Directive appeared appropriate.

## **Retro-filling Transformers**

The EU Directive prohibits the topping-up of transformers containing PCBs, but allows the retro filling of such transformers, on the basis that the replacement fluids carry markedly lesser risks.

It was proposed that these aspects should also be reflected in the new Romanian legislation concerning PCBs, but the working group decided to be banned.

## ***Permitting for Storage/Disposal***

In addition to the inventory requirements, the EU Directive demands that parties disposing of PCBs must be subject to Permitting; must maintain registers of the quantity, origin, nature and content of the PCBs delivered to them for disposal; and must submit these to the competent authorities.

At present, this requirement would not exist in Romania, as no adequate disposal facility exists nationally for PCBs. However, there would be a need for either:

- a robust system for the registration of materials to be placed in storage, awaiting later disposal (to include approval of the methods and site of storage); and
- a second system covering the export of PCB-containing materials from Romania, for disposal elsewhere.

The United Kingdom legislation could act as a model for each of these, as a registration form was included in the United Kingdom Action Plan for PCBs; and a robust Duty of Care system already exists covering the disposal of wastes in the United Kingdom. It was proposed that similar systems should be developed for Romania, and that these should be consistent with the new Waste Regime Law under development in the MWFEF.

In addition, the EU Directive prohibits the disposal of PCBs by incineration on board ships, and requires that any incineration of PCBs must comply with Directive 94/67/EC on the incineration of hazardous wastes. It is considered that the new Romanian legislation on PCBs should include both of these requirements in order to reflect EU law.

### **The Mixing of Oils Containing PCBs**

Although the EU Directive does not cover this topic specifically, the United Kingdom Action Plan bans the mixing of oils containing PCBs, with those not containing PCBs. It was agreed that the Romanian legislation should reflect this issue also.

### **Results**

Following the IMWG meeting, Dr. Phillips revised the draft regulation to reflect the comments of IMWG members and those of a legal adviser to the HIID team, Prof. Mircea Dutu. The final draft regulation was submitted to the Ministry in July 1999. The regulation was approved as a Government Decision in 2000 (GD no. 173/2000).

## **3.4 Technical Norms for Remediation of Contaminated Soil and Groundwater**

### **Background**

The development of norms for remediation of contaminated soil and groundwater has been underway in Romania prior to EPIQ's involvement, with the former C4EP project contributing an options paper prepared by Mr. John Fitzgerald, covering both soil and groundwater remediation. The work on the remediation norms had been motivated by the absence of norms for groundwater quality, with drinking water standards invoked in the absence of remediation norms. Such an application could lead to inefficient management of groundwater sources, if sources would be required to remediate to the strict drinking water standards. In addition, the Romanian environmental framework did not provide for criteria for assessing groundwater or soil contamination, nor had groundwater of Romanian been classified in terms of quality parameter and use, limiting the opportunities for considering risk-based remediation norms.

### **Approach**

The team's efforts of this period were directed towards the development of the "Technical Guidelines for ground water quality" as proposed in the Work plan. Work on remediation norms for soil was postponed because of the limited availability of local expert, Mr. Mihai Dumitru. Also, a decision had been taken in 1998 by an interministerial working group to give a higher priority to groundwater remediation, in part because of the difficult unresolved issues related to liability for historic soil contamination.

The process for developing these norms has followed the EPIQ working group approach. On the basis of the C4EP Options Paper, two EPIQ consultants, a local groundwater specialist, Dr. Mircea Vintilescu, and a legal expert, Dr. Mircea Dutu, developed a draft proposal for the groundwater remediation norms. The norms (in Romanian language) were translated and provided to Mr. Fitzgerald for his comments and redrafted. EPIQ organized a working group meeting on May 31, involving key stakeholders, at which the proposed groundwater norms were presented by Mr. Rojanschi and Mr. Vintilescu and discussed by the Working Group. Written comments were also solicited.

The written and verbal comments of the participants of the meeting were reviewed, analyzed and incorporated in the minutes of the meeting in collaboration with the local expert, Mr. Vintilescu. These comments were jointly analyzed with representatives of the Ministry of Water, Forest and Environmental Protection (General director Liliana Mara) and National Company Apele Romane (Director Petre Serban). Several extensive and explorative discussions took place between EPIQ team and the EPIQ foreign consultant Mr. David Phillips, on the technical norms for remediation. The summary of the draft proposal was finalized by EPIQ with support of Mr. Vintilescu and subsequently submitted to Water Directorate of the MoWFEP.

To complement the technical norms for groundwater remediation, EPIQ consultant, Mr. David Phillips prepared Remediation Procedures for Contaminated Soils and Groundwater. This document covers the process of conducting remediation activities to meet the norms. EPIQ submitted the draft report to the Ministry for review and the document was revised based on comments. The draft report was then tightened in legal form for consideration and submitted to the National Water Company “Apele Romane” and the Water Department of the MWFEF.

As noted progress in developing norms for soil remediation was slower. Discussions were held with local experts on the need for and possibility of developing further the provisions of MWFEF Order 756/97: Norms of Quality Criteria for Soils to meet Environmental Requirements. It was decided that the current Ministry order is sufficient at the present time, given the limited enforcement capacity and lack of direction in setting policy.

## **Results**

The resulting Draft Norms for Groundwater Remediation were finalized in 1999. At the conclusion of the Task Order, MWFEP had not yet promoted the norms as a Ministerial Order.

## **Chapter 4**

### **Institutional Restructuring and Capacity Building**

#### **4.1 Water Tariffs**

##### **Background**

Through this activity support was given to the Ministry of Water, Forest and Environmental Protection and National Company Apele Romane to the development of the national methodologies for differentiated water prices and tariffs for water services on river basins.

The activity was linked to the last restructuring of the water sector, implemented primarily by the General Water Directorate of the Ministry of Water, Forests, and Environmental Protection, the National Water Company Apele Romane, the river basin water subsidiary companies, and the new proposed river basin commissions.

The Government Decision on the reorganization of National Company “Apele Romane” (March, 1999) took into consideration the HIID/EPIQ proposal that creates a new water management structure which implements full self-financing and facilitates integrated media management by the environmental protection agencies.

In addition the government was anxious to remove regulatory responsibility for water management from basin authorities and added to those of EPAs and to retain only the non-water consumer activities, like power generation plants or construction of bridges across rivers. There is still an open question if these activities will be approved by the new water body or by the future River Basin Committees (RBC).

The principal counterpart is General Water Directorate of Ministry of Water, Forest and Environmental Protection. National Company “Apele Romane” and the subsidiary river basin water companies also played roles in the development of the methodologies, but the principal counterpart for the EPIQ portion of the overall activity has been the General Water Directorate since it is responsible for the preparation of the Government Decision. As proposed by EPIQ-team, the Inter-ministries Working Group on economic instruments in the Water Sector with participants from interested economic sectors has been reactivated.

The commitment of the Government has already been demonstrated by the commencement of the restructuring of the sector last year, the removal of Apele Romane’s monopoly over the permitting for the supply of raw water, and the transfer of authority for enforcement of regulations on the discharge of pollutants to the local EPAs.

Romania's application to join the EU requests the approximation of its legislation to that of the EU. The new directive on water policy requires that water prices should be sufficient to cover the full economic cost of supply and that, in the long term, there should not be no subsidies.

Currently, Romanian water prices remain very low. Low prices mean that cost recovery is not achieved. The sub-optimal performance in all river basins, in the various water sub-sectors results in high costs, declining services, environmental degradation and weakened benefits.

Analysis of Romania's water sector shows that current prices are based on demand-side allocation although the legal and institutional systems for full cost recovery are already in place.

The current prices are spatially uniform and sectorally differentiated exactly the reverse of what efficiency requires. Furthermore, water rates do not cover the long-term marginal cost of supply. Raw water is supplied by the entity Apele Romane, which charges for raw water delivery to farms, municipalities and industry as well as for water taken directly from surface and ground water sources by users. There is a single, national price for each category and use of raw water. Industry pays more than agriculture that pays more than households do. Likewise, there are separate national raw prices based on type of water body; water from the Danube, ground water and inner rivers and lakes each have different prices (ground water sources are most expensive, about 20% more costly than domestic surface waters, while water taken from the Danube is about one-eighth as expensive as surface water). According to the legislation, the implementation of full cost pricing by river basins is set to become a reality. Between 1950 and 1990, demand for water in Romania increased fifteen-fold, making reform urgent.

In spite of several apparent advantages including risk allocation between the branches and everyone's access to water uses, the current economic system has large disadvantages identified by the analysis of water pricing in the case study in Somes-Tisa river basin undertaken by this EPIQ activity. There are several factors contributing to non-payment by users. First, incomes have fallen in real terms while prices have risen. Second, previous incentives and enforcement mechanisms are non-operative. Third, the current approach of using a water price that does not reflect the economic reality plays a major role.

One of the appropriate measures to remediate these situations is the introduction of a differentiated water price on each river basin. The Marginal Opportunity Cost (MOC) pricing approach was used to analyze the full economic cost for raw water in the Somes-Tisa river basin, for a discount rate of 12%. The resulted water price is 267.31-LEI/ m<sup>3</sup> compared to 67.72 LEI/ m<sup>3</sup> which is the current raw water price for the whole country.

The recognition that current water pricing in Romania covers only a small fraction of the full cost of providing and maintaining water services pointed to an urgent need to implement full-cost water pricing. A prerequisite to doing this is a determination of the nature and magnitude of costs associated with sustainable providing water services.

The Ministry of Water, Forest and Environmental Protection is supportive of cost internalization for water resources, and that prospects were positive for the gradual implementation of full-cost water

pricing in several river basins and potentially at the national level as well. The ministry has shown interest to identify economic instruments to stimulate pollution sources to co-finance environmental abatement investments in order to meet the permit requirements. The need to identify a mechanism to provide the required O&M funds for flood prevention activities has been a key element of the methodology.

Some of the economic instruments recommended for implementation were full-cost pricing, differentiated pricing for different user groups and pollution discharge fees.

## **Approach**

This EPIQ activity included (i) a study to review existing economic instruments in the water sector and their impacts on the economy and the environment, (ii) a research on the impact of a differentiated water price on the users on a selected river basin (Somes), (iii) a Marginal Opportunity cost approach was used to analyze the full cost of water in a selected river basin (Somes river basin). Results showed that even under the 1998 legal and pricing arrangements the national raw water price is only 25% of the full economic price, and (iv) a proposed methodology for setting differentiated water prices.

In the absence of any other similar national study, the key international literature reviewed and additional guidance provided by an EPIQ foreign expert intended to provide *a priori* information for this activity. The main focus has been to evaluate the financial reports of the river basin branches in order to facilitate the development of a realistic solution for the financing of water sector. Surveys were organized and questionnaires have been sent to be completed by water users, of various sectors, municipality, industry and agriculture, to identify the vulnerability to any change of water price. These questionnaires included general data on the type of user, economic parameters of the enterprises and information on the water abstraction, effluent discharge, prices and tariffs for the water services. The information was collected along two different years.

Two local experts (Dr. Ion Tecuci) and Director Beatrice Popescu were involved in (i) the collection of the data, (ii) given contribution to the proposed methodologies and (iii) establishment of contacts with the National Company “Apele Romane”. In addition, Dr. Steve Warren (UK) provided support for the finalization of the methodologies. All three experts contributed to the success of the seminar organized in the Ministry of Water, Forest and Environmental Protection.

The whole EPIQ team of this activity managed to have full access to the decision makers in the General Water Directorate, primarily because of the long-standing working relationships between members of the EPIQ team (Dr. Mihaela Popovici) and ministry staff built during the development of the Water Law and several related regulations.

The final outcome for this activity is reduced environmental damage to the waters of Romania caused by overuse of raw water and excessive discharges of pollutants. This would be accomplished through changes in the behavior of individuals, firms, and municipalities to reduce the use of raw water and the generation of pollution.



The final product is the Government Decision to propose the system of full-cost water pricing and discharge tariffs by the General Water Directorate of the Ministry of Water, Forest and Environmental Protection. The system is to be accepted by the river basin water companies, the future river basin commissions, and ultimately by individuals, firms, and municipalities. Implementation of this Decision would place the raw water system on a cost-recovery basis with the aim of "getting the prices right" so as to produce a more effective water appropriation among the users and that eliminates the need for subsidies from the State budget. Improved discharge tariffs will increase the efficiency of water use by individuals and firms, reducing environmental damage associated with excessive use. This will also stimulate investment in pollution abatement equipment by firms, and in wastewater treatment by municipalities. In addition, these changes will stop further deterioration of the water sector infrastructure by providing adequate operation and maintenance funds. Pricing would be differentiated by river basin, replacing the old system of a single national price. Without the technical assistance planned by the EPIQ team, it is likely that the present system of inter-basin subsidies and the top-heavy national water company to administer them would remain.

The output of the consists of technical inputs in the form of (i) national methodologies for river basin level water prices, tariffs, (ii) Government Decision on the payment system, including allowances and penalties, (iii) list of the water services and products, and (iv) the seminar on water sector financing with international and local experts.

During the water sector study, several group meetings were organized by the EPIQ team, National Company "Apele Romane" and the Ministry of Water, Forest and Environmental Protection to discuss the motivation for undertaking the research and describe the research methods. The final national workshop 31 May 1999 was organized for the acceptance of the results and recommendations of the study and policy options outlined in the proposed methodologies. The participants have fully agreed on the need to look into social implications due to the implementation of full-cost water pricing policies and to propose the design and implementation of policy instruments for water sector able to mitigate any negative implications. The consensus has been reached on the need for setting water charges to cover the cost of supply, treatment and transmission, including any administrative and transactions costs. However, equity considerations have been mentioned in setting charges, for which the principles are less clear.

The water effluent charges "tariffs" was analyzed, including the two components: the base rate and the penalty and a new proposal on the methodology for water tariffs were developed.

The issues to be analyzed include:

- The adoption of a two-part tariff – national and local basin
- The choice of mechanism for providing funds for capital investment
- Assets with indefinite life: depreciation or asset renewals charge?
- Dealing with large variations between tariffs in different basins
- Methodology for determining sustainable yield
- Price elasticity curves for different users
- Relation between level of bad debt and tariff for different users

On the water tariffs for the wastewater services, the existing list of substances taken into consideration for the water charges and penalties determination has been proposed to be extended.

## **Results**

There is a need to understand the social and environmental costs and benefits of different reform measures and to assess the impacts of water pricing on various users. This component of the project helped propose legislative actions required supporting the implementation of selected economic instruments: full-cost water pricing. The new economic instruments (full-cost water pricing) and procedures to assist the management of water sector are consistent with the provisions of the new legislation, which is based on the “polluter-pays” and “beneficiary-pays” principles

It is expected that the restructuring of the water sector initiated last year will continue, and that the water law will be updated to reflect the institutional restructuring (River Basin Committees). The EPIQ team’s full-cost pricing methodology also assumes that the revenue collection procedures of the river basin committees and the river basin water companies will be improved, and that sufficient revenues are collected to ensure that all water supply activities at the river basin level will operate on a self-financed basis. In addition, the Government will need to identify revenue sources for water-related activities that will not be fully funded by the new water prices and tariffs, such as the costs of flood prevention and control, and the collection of hydrometeorological data.

Success in this activity will also encourage the implementation of the river basin committees, which were also developed with USAID support. The EPIQ team believes, however, that the restructuring will continue with creation of the River Basin Committees and implementation of the differentiated full-cost water price.

However there are some questions from National Company “Apele Romane” whether full-cost pricing is the only viable approach to sustainable management of water resources. The EPIQ team felt that it is critical, and to avoid shocks to the economy it would have to be implemented in a phased manner. The proposed legislative measures support the implementation on a pilot basis of the selected economic instrument (full cost water pricing).

The role of Apele Romane will change when river basin pricing is adopted. There will, however, still be a need for central functions that Apele Romane could satisfy. These include:

- Calculating and administering the national component of the water tariff.
- Allocating funds for national tasks such as flood protection.
- Ensuring that the river basins use the same consistent methodology for calculating basin tariffs.
- Ensuring that tariffs are neither too high (profiteering) nor too low (failing to cover costs).
- Providing arbitration in disputes over inter-basin water transfers.
- Setting targets for efficiency in the river basins.
- Auditing the results of the basins.

- Providing methodology for river basin plans and quality control for the plans themselves.

The recommendations of the team include:

- a) The price reform should be gradual/incremental
- b) Raw water tariffs should be calculated to cover:
  - The operating costs of National Company “Apele Romane” in respect of water resources and water supply;
  - The capital charges associated with the water resources and supply infrastructure;
  - The operating costs in respect of flood prevention and protection;
  - The capital charges associated with the flood prevention and protection infrastructure;
- c) In the short term, price should be raised at the minimum to a level, which can cover the full economic cost of provision. In the long term it is undesirable that flood prevention costs should be included in the water tariff since the benefits of flood protection do not correlate with raw water consumption. In the short to medium term flood protection costs will either be included in the raw water tariff or paid directly by the state, but the accounts for flood prevention and protection should be presented separately from those for raw water supply. In the long run, the user cost and the environmental costs of exploiting the resource should also be included in the raw water price.
- d) Differential pricing is permissible between users as long as the price reflects real differences in the cost of supplying water to different users. These differentials will be essential incentives for developments with a large demand for water to locate in the basins with abundant supplies and low costs rather than in basins of shortage, and therefore high costs.
- e) The raw water price reform should be integrated into the economic reform as a whole and should be adjusted in accordance with piped water price reforms.

Beyond the immediate findings as this work has stopped with the end of the task order research may be carried out to ensure that water prices reflect the varying costs to different users of extraction from the particular source, distribution system and sewage system. Also, alternative methods of recovering the cost of flood protection need to be developed, possibly through land or property taxes.

## 4.2 Self-financing of Local EPAs

### Background

The ongoing EU approximation process and restructuring of economy in Romania developed new environmental legislation and responsibilities for enforcement in charge of central and local environmental protection authorities. All these requirements need stronger institutional capacity. Straightening institutional capacity is difficult if not impossible considering the reduced sources of financing ensured by the state budget especially when other priorities have been established. For the above reasons, the C4EP programme advised the central environmental protection authority to set up extra-budgetary accounts systems for their subordinated structures, based on tariffs for permitting and other kind of

services provided by these authorities. The initial proposal submitted by C4EP team, consisted in a draft text to amend the Environmental Protection Law no.137/1995 (art.13) by adding necessary legal provision, and a set of technical norms for setting the tariffs amount. The system was conceived in such a manner that responds to the main targets, as following: a) to cover the expenses for material/human efforts for services provided; b) to increase the staff capacity, and c) to set up a sustainable financing system for environmental protection authorities.

Every success of the best strategy and policy for environmental protection are supposed to be based on the implementation and enforcement's capacity, and, the sustainable system for financing the environmental protection authorities is the background of this capacity. Other foreign donor's programmes, like World Bank, are conditioned by fulfillment of self-financing requirement, EU approximation is based on authorities capacity, so, even if superfluous, the reality is that every plans for environment are not only related, but depending on this topic.

## **Approach**

EPIQ activities to support adoption of the system of self-financing for local EPAs involved two stages of activity. During the first stage, the EPIQ team assisted in finalizing the draft legislation. Several consultation meetings took place to facilitate the approval and promotion of this provision on the agenda of the Ministry and the government. Both chambers of Parliament approved the Law to modify the existing Environmental Protection Law no. 137/1995 (by adding Article 13', which became, after the approval, when the law was re-published, the new art.14.) Article 13 establishes a system of tariffs that enables EPAs to collect for services provided to environmental permit holders by the EPAs. In addition, extra-budgetary accounts may be established to receive tariff collections and account balances may be carried over at the end of the fiscal year.

The second stage of EPIQ support for the new system of self-financing centered on the steps required to implement the system. A meeting of local EPAs was organized in Brasov at the beginning of August to discuss implementation issues and documents required to support implementation. The participants in that meeting included directors of the Bacau, Baia Mare, Brasov and Bucharest EPAs. The goals of the meeting was to present proposal for "Methodology of setting tariffs" to be approved as Ministerial Order, deciding that the "Methodology of providing incentives for staff" will be completed later.

Following the meeting in Brasov, the EPIQ team drafted an action plan to implement the system of self-financing. The paper was prepared in English, translated into Romanian and distributed to MWFEF. A seminar was held on October 21 to present the action plan. A small working group was established by MWFEF to prepare the ministerial order to implement the system of self-financing on an interim basis.

## **Results**

The Ministry, working with a small committee of Ministry and EPA representatives, supported by EPIQ, promoted a Ministerial Order to initiate the system of self-financing by establishing tariff rates and related procedures. Ministerial Order no. 340/03.20.2000 was approved in March 2000, enabling local EPAs to begin collecting tariffs in April 2000.

## **Chapter 5**

### **Economic Instruments**

#### **5.1 Sulfur Tax**

##### **Background**

Combustion of fuels with significant sulfur content (particularly coal, fuel oil, diesel fuels, and natural gas) results in air pollution in the forms of sulfur dioxide and sulfate aerosol. The former pollutant contributes to the formation of acid rain, impacting on forest and agricultural productivity, the acidification of water bodies, and material damages to building and other structures. Sulfate aerosols are a form of fine particulate pollution that has been attributed to a range of respiratory ailments.

One of the most effective preventive measures for reducing pollution from sulfur-bearing fuels is to substitute lower for higher sulfur content fuels. However, this can be a costly approach relative to pollution abatement options. Also, such a switch may be unattractive to countries with proven reserves of fuels with high sulfur content.

The process of harmonizing with EU legislation will require Romania to adopt standards limiting the content of sulfur in motor fuels and to control SO<sub>2</sub> from large combustion sources. However, the government is considering options ahead of the introduction of these EU requirements, in part because of conditionality related to the pending World Bank environment loan. The EPIQ team was asked to prepare a paper on the introduction of a system of taxes on the sulfur content of fuels, including an implementation plan.

##### **Approach**

Initially, the EPIQ team began developing the paper to cover programmatic and implementation elements for coal, fuel oil, diesel fuel and high sulfur natural gas from Russia. The counterparts for the development of the paper included MWFEP, the Romanian Automobile Authority (within the Ministry of Transport) for diesel fuel, the Ministry of Industry and Trade (for coal and fuel oil, and the Ministry of Finance for tax collection. Other key stakeholders were involved in meetings and the IMWG including representatives from the National Oil Company PETROM and various research institutes.

The EPIQ team was subsequently requested by MWFEP to focus more narrowly on a sulfur tax on diesel fuels. The discussion of a sulfur tax on other fuels was delayed (and was not reopened before the completion of the EPIQ Task Order). The paper on the sulfur tax proposed an environmental charge<sup>1</sup> (tax) on sulfur content of diesel fuel imposed at the refinery gate and on all imported diesel fuel.

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<sup>1</sup> Diesel fuel sold in Romania has an average sulfur content of 0.5% by weight. Some diesel fuel refined to meet the 0.05% EU norm is sold in the domestic market, effectively lowering the average sulfur content to about 0.50%. The cleaner diesel fuel is mixed with 0.60% diesel fuel in the supply system so that fuel vendors and consumers do not

The charge could be structured in one of two ways: (1) on the entire sulfur content or (2) on only the amount in excess of 0.05%. The paper provided some guidelines on the magnitude of the charge. The charge should not exceed the magnitude of damage to health and the environment. (For the analysis, a damage estimate of \$19 per kg was used). The lower limit for the charge would be the amount necessary to offset any price advantage of high sulfur crude oil to refiners in Romania. The “sulfur premium” or price differential in world markets is a good indicator of the additional cost that refiners incur in removing sulfur. It should be recalled that Romania imports significant quantities of both crude oil and refined products. Different qualities of both crude oil and refined products are available on the world market; crude oil and products with higher sulfur content command a lower price. To offset fully the price advantage of high sulfur crude oil would require a charge of about \$3 per kg of sulfur (though at times the differential in world prices is as low as \$1 per kg). A charge of \$3 per kg on all sulfur in diesel fuel would increase the cost of 0.6% sulfur diesel fuel by \$0.015 per liter (nearly 2 cents, or about 5 percent of current price). A charge of \$2 per kg on only the excess over 0.05% would increase the cost of 0.5% sulfur diesel fuel by \$0.009 per liter.

Estimating the revenue from this charge is difficult, since refiners can respond by: (1) paying the charge; (2) lowering the sulfur content of diesel fuel by purchasing lower sulfur crude oil; or (3) adding desulfurization units, which they will need eventually to meet EU norms. The principal impact of the charge would be to discourage importation of high sulfur crude oil. About 2 million metric tons of diesel fuel is produced each year, with an average sulfur content of 0.5%. Assume the only the excess over 0.05% sulfur is subject to the charge. Refiners are unlikely to make any response to a charge of \$1 per kg, since the costs of responding exceed potential savings. At \$3 per kg, the charge refiners would be indifferent between the alternatives of buying lower sulfur crude, making refinery desulfurization investments, and paying the charge. Assume that the average sulfur content of diesel fuel drops by one half (to 0.20%) due to a combination of purchases of low sulfur crude and investments in desulfurization at refineries. Revenues would be \$4 million annually. At a charge of \$4 per kg sulfur, all diesel would be 0.05% sulfur and revenues would be zero.

## **Results**

The background paper was distributed to counterparts and used by MWFEP to elaborate the Draft Regulation for removing sulfur from diesel fuel. EPIQ subsequently reviewed the Draft Regulation. The Draft Regulation was sent for approval to various ministries but the Ministry of Finance opposed the draft regulation because the Environmental Fund was involved and this was not in place at the that time. The objection was related to the ambiguous way in which the penalties would be collected (this item was added by senior staff of MWFEP without involving EPIQ team).

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know the sulfur content of an individual tank of fuel. EU Romania plans to lower the sulfur percentage gradually until it conforms to the EU norm. A charge on the sulfur content would facilitate this transition by rewarding refiners who make fuel cleaner than the maximum limits. The amount of 0.05% diesel fuel sold in the domestic market should rise, helping to reduce sulfur dioxide and fine particulates in the air. The analysis showed that the cost of diesel fuel would rise by only a modest amount.

## 5.2 Lead in Gasoline

### Background

A major source of airborne lead is the combustion of leaded fuels in motor vehicles. In Romania, leaded gasoline is still used by a majority of motor vehicles. As part of the Environmental Action Program for Central and Eastern Europe, Romania participated in the special initiative on the phase-out of leaded gasoline. Most developed countries that have eliminated leaded gasoline have taken one of two approaches: a phase-out over a prescribed timeframe during which both leaded and unleaded gasoline would be available; or an immediate halt in supply of leaded gasoline, replaced by unleaded gasoline and a lead-substitute fuel, the latter often priced above unleaded gasoline. The phase-out option has been the more popular approach, enabling domestic refineries to develop capacity to produce unleaded gasoline and lead-substitute gasoline (which meet the octane requirements of vehicles that burn leaded gasoline).

The replacement of leaded gasoline is a costly proposition, since the new gasoline formulations tend to be more expensive to produce. There is also an equity issue associated with the phase-out of leaded gasoline because it is the older vehicles that used leaded gasoline. Efforts to encourage motorists to switch over to unleaded fuels by introducing differential taxes on leaded and unleaded gasoline will impose a higher economic cost on owners of older vehicles. Nevertheless, owners of older vehicles will be more burdened as well if required to switch over to lead-substitute fuels.

### Approach

As a continuing activity under C4EP, the EPIQ project team drafted a paper on the introduction of unleaded gasoline for MWFEP. This paper was reviewed by the Ministry and revised before the work plan was finalized in 1999. In the paper, EPIQ recommended *Proposals for improving price differentiation in favor of unleaded gasoline<sup>2</sup> in Romania*.

At that time,<sup>3</sup> the price for gasoline in Romania was slightly lower for unleaded gasoline. This is mainly because the excise tax for leaded gasoline is 5-8 ECU/ton higher than for unleaded gasoline. As a result, at the gas station the retail price for leaded gasoline is greater with an average of 100 lei/liter (that means 2.1% above unleaded gasoline prices). According to discussions that took place at the seminar held at RAR (Romanian Auto Register) in September 1998, the difference among prices for unleaded and leaded should be around 10% in order to have an incentive effect and not to create unwanted distortions on the market.

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<sup>2</sup> It is important to mention that the price for various grade of gasoline increased according with the exchange rate lei/EURO; for instance in late 1998 and early 1999 the price was around 4500 lei/liter and in late 1999 the price increased twofold.

<sup>3</sup> March 1999



To promote the desired shift toward unleaded gasoline, three measures were proposed: two economic instruments plus a change in the lead standard.

### ***Extra charge on leaded additive in gasoline (tetraethyl of lead)***

This charge is designed to provide incentives to refineries to use MTBE as a substitute octane enhancer. The analysis shows that lead introduced in gasoline should be subject of an extra charge at a rate so that 0.15 grams of lead cost 0.5 cents US (about 3.5 cents per gram of lead - or \$35 per kg of lead). That charge would be adequate to encourage the refiner to pay for a lead substitute additive plus the 10% MTBE needed to boost octane. In 1998, the consumption of gasoline was expected to be 2.2 million tons with a 579.3 tons consumption of lead (average of 0.263 kg/ton). The tax on lead would have added an extra \$9.20 - \$10 to the cost of one tonne of leaded gasoline at the refinery gate.

This solution is the best solution for inducing refineries to phase out the lead from gasoline. At the pumps, gasoline would be available in two grades: leaded and unleaded, but the refinery could supply leaded gasoline of any lead content<sup>4</sup> from 0.07 grams per liter up to the limit that is in effect according to Romanian standards (maximum 0.32 grams/liter). The refiner has to declare the lead content as the gasoline moves across the refinery gate<sup>5</sup>. The tax would be calculated in terms of dollars per kilogram of lead (to counteract inflation in the calculations).

### ***Increasing the difference in excise tax for gasoline***

The second modification would involve increasing the differential in the excise taxes for unleaded and leaded gasoline to stimulate demand for unleaded gasoline. At that time,<sup>6</sup> the excise tax was 235 EURO/t for leaded gasoline and 230 EURO/t for unleaded gasoline; a difference of only 5 EURO/ton. The proposal made by EPIQ team was to increase this difference up to 30-35 EURO/ton.

The gasoline price will suffer the following changes<sup>7</sup>. First, after applying the supplementary tax on lead the price of the one tonne of gasoline at the refinery gate will be \$10 (~100,000 lei) greater for leaded gasoline than unleaded (assuming that the prices are the same before the supplementary tax on lead is added). Second, increasing the difference of the excise tax from 5 EURO/ton to 30 EURO/ton of gasoline will result in a difference of 442 Lei/liter. This solution could be easy to introduce and put in practice taking into account the experience accumulated.

### ***Changes in the Lead Standard***

It is important to take steps to modify the actual standard regulating the lead in gasoline (SR 176-97). The proposal would involve making the lead standard stricter over a 5 to 7 years period.

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<sup>4</sup> Actually the lower limit could be even 0.03 grams per liter, as this is more than adequate to protect soft valve seats.

<sup>5</sup> It is supposed that samples are taken to verify what the refiner claims regarding the lead content.

<sup>6</sup> March 1999

<sup>7</sup> Assumptions made: Before applying the new taxes the Refinery Price is the same for both type of gasoline and the gasoline density is 0,77 kg/liter

## Results

Following a series of discussions between EPIQ and experts from MIC, MT, MoF and MWFEF, a recommendation was drafted to modify the excise tax in favor of unleaded gasoline up to 30-35 EURO/ton. Subsequently, MWFEF sent a letter to MoF requesting this proposed change be reflected in excise taxes. In January 2000 the new Government, appointed in November 1999, introduced significant modifications to the tax system (VAT decreased from 22% to 19%, profit tax decreased from 38% to 25% etc.) as well as excise taxes for several goods. For gasoline the new excise tax decreased as follow: a) leaded gasoline from 306 EURO/ tone to 270 EURO/ tone; b) unleaded gasoline from 294 to 220 EURO/tone. As the result the difference between the two gasoline types is now 50 EURO/tone. At the pump, with cumulative influences of the VAT and excise tax, the difference will be 600 lei or about 6% of the price of leaded gasoline.

### 5.3 Recycling and Recovery of Wastes in the Transport Sector

#### Background

The uncontrolled disposal of used vehicle batteries, scrap tires, and used motor oil represents a threat to public health and the environment. In addition, disposal, even if limited to controlled landfills results in accelerated consumption of landfill capacity that could be avoided through recycling and recovery. From a natural resources perspective, the replacement of these products requires production and consumes raw materials. Recycling or processing of recovered material can reduce the necessity of utilizing natural resources.<sup>8</sup>

To ensure these waste products are properly recovered or disposed, a number of policy mechanisms could be used. In addition to mandatory recycling or disposal, economic instruments such as a deposit/rebate system might be considered. Because of the dispersed nature of the waste products involved, regulatory approaches may be less attractive than approaches, which create incentives. Under a deposit-refund scheme, it is the refund that provides the incentive for proper disposal. Unlike a pollution tax where the cost per unit of pollution may provide incentives to reduce their level if control options are less costly than paying the tax, the initial deposit in the deposit/refund scheme serves the purpose of generating revenue to finance rebates. Vehicle owners are unlikely to adjust their vehicle ownership decisions in response to the costs associated with the deposit since there are no substitutes for these components.

The challenges in implementing a deposit-refund system relate to a number of issues:

- estimating the volumes and distribution of waste streams;

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<sup>8</sup> In addition to the materials balance argument, recovery processes must be justifiable on economic grounds as well. Thus, if the full social costs (assuming the costs of disposal are appropriately accounted for) of recycling exceed the costs of producing replacements from virgin raw materials, recycling and recovery would not be desirable. However, studies have shown that recycling of wastes, particularly batteries and tires can be economically attractive, provided the collection and transportation costs are not too great.

- setting the level of deposits and refunds;
- determining at which market level collection should take place (e.g., on the deposit side, options are at manufacturer, retailer, consumer);
- organizing the collection and transport process;
- assessing recycling/recovery technology options and their costs; and
- determining the institutional requirements to operate and monitor the deposit/refund scheme.

## **Approach**

For each of the three waste management issues, the EPIQ project team developed a separate option paper. Dr. Victor Platon was the principal author of each option paper. Dr. Robert Anderson, a U.S. expert on economic instruments, provided background documents and commented on early drafts. In addition, a number of Romanian experts were contacted in the development of the reports. In addition, Dr. Platon organized a number of preliminary meetings with staff from MWFEP, the Ministries of Finance and Industry and Trade, ICIM, the Recycling Commission, and the Romanian Auto Register to identify sources of data needed to estimate volumes of each waste stream and discuss potential elements of management programs.

The draft option papers were prepared in both English and Romanian and distributed to members of the three inter-ministerial working groups prior to the IMWG seminars. The seminars were convened on July 6 (scrap tires), July 9 (batteries), and July 29 (used oil). All three seminars were structured similarly; Dr. Platon made a one-half hour presentation, followed by a two-hour discussion. Following each seminar, IMWG members were asked to provide written comments on the draft options papers. Comments were also provided by Subsequently, Dr. Platon revised each options paper and submitted them to the IMWG members. An overview of the options that were discussed for each recycling/recovery issue is provided below.

## **Policy instruments for recovering scrap tires in Romania**

For recovering scrap tires a deposit - refund scheme has been proposed. According to this scheme a charge of 1 to 1.5 EURO would be levied for each new tire. This charge would be paid by the producers of new tires and by importers of new or used tires and would be reflected in the price of new tires. When a new tire is sold the receipt issued would include the price of the new tires and the value of the deposit. The deposit-refund scheme would also apply to importers of used tires, possibly with some adjustment for tire age and condition. The revenue from deposits would be directed to a Recycling Fund under the supervision of the National Commission for Waste Recycling within the Ministry of Industries and Commerce. From this fund reimbursements and subsidies would be made when tires are properly recovered. Collectors would accept scrap tires earning 0.50 EURO for each scrap tire accepted; from this money 0.25 EURO would be reimbursed to the person returning the scrap tire.

## **Options for battery recycling**

Three options were developed for recycling batteries. The first option would involve recycling at collection centers, combined with a mandatory deposit-refund system. The basic scheme would have motorists pay a deposit at the time of purchase of a new battery. The motorist would receive a receipt for the deposit. The battery retailer would forward all deposits to a central authority (NCRM - Recycling Fund). It is possible to apply the deposit at the batteries producers and at the importers. This could facilitate revenue collection because there are few producers and importers. Later, when the motorist delivers the old scrap battery plus the receipt to a collection center, the amount of the deposit would be refunded. Collection centers would submit their deposit receipts to the central authority (NCRM - Recycling Fund) for reimbursement. Used batteries would be transported to the recycling factory. Based on evidence from jurisdictions where deposit systems are used to stimulate battery recycling, the deposit amount probably should be approximately \$5. Some potential problems with this approach stem from the physically different locations of retailers and the collection centers. Not only does this mean an additional trip for the motorist, but it also means that a central administrative authority would have to collect funds and make disbursements, adding to administrative costs.

The main idea of the second option would be to require that battery retailers accept scrap batteries from motorists. Because of their limited storage space, battery retailers are unlikely to be willing to pay motorists for the scrap batteries. Consequently a simple mandate that retailers accept scrap batteries is not likely to increase recycling because motorists likely would continue to return scrap batteries to collection centers. Thus, a deposit-refund system probably would be required here as well to motivate motorists. Assuming a deposit system is mandated with this option, retail battery stores would collect the deposits at the time of sale of new batteries and would pay the refund from those deposits as soon as the battery that is being replaced is returned. No central government authority would be required to handle the deposits. Battery retailers would be able to recover the costs of providing storage facilities through two means: raising prices (since all retailers would be affected) and keeping unclaimed deposits (when motorists fail to return the scrap battery for a refund). Again a deposit of approximately \$5 would appear to be the right magnitude.

A third option would place the burden on manufacturers of new batteries. They would be allowed to sell a new battery (or put one in a new car) only if they could produce evidence that they had retrieved a used battery (or had a collection center, business interest, or individuals collect it on their behalf) and had it recycled. The deposit would be collected at fewer points (battery manufacturers and importers) and directed into a Recycling Fund within NCRM. NCRM would be in charge of managing the Fund and handling money transfers. *End users* would pay the deposit only if they do not returned an old battery when buying a new one. Collection Centers would be the points for reimbursing the deposits (less costs related to system functioning) when a scrap battery is returned. Selling shops, service centers, and gas stations would collect used batteries and ship them either to the Collection Centers or to the Battery Manufacturer when they receive a batch of new batteries. A part of the deposit would be paid as well. The firms dealing with new and used batteries would be the subjects of certification by EPAs as well as random inspections. Collection Centers could ship the scrap batteries either to the recycling plant or export them observing the demands for protecting the environment (keeping the acid inside the battery, etc.). Transporters and collection centers would have to obtain an operating permit.

To deal with the existing inventory of scrap (discarded or dumped) batteries that could be recycled but currently aren't due to the lack of incentive to bring the batteries in to collection centers, a separate system could be developed. This companion system would impose a modest tax on new battery sales and use the funds to reimburse collecting points or battery retailers for each scrap battery they accept without a new battery deposit receipt. At first, the amount offered could be set at a level only slightly higher than collecting centers currently pay. Over time the amount paid could be increased to attract batteries that are more expensive to collect and return. Once environmental authorities were convinced that the scrap battery inventory had been reduced to an acceptably small amount, this program would be terminated.

Of the three options, EPIQ recommended the second option and developed an implementation plan for this scheme.

### **Proposals for the Implementation of a Waste Oil Recovery/Reuse System**

Three options for a waste oil recovery/reuse system were developed by EPIQ for consideration by the Working Group.

*Deposit-Refund System.* The main feature of this system is a deposit paid by oil consumers with a portion of initial deposit reimbursed later on. If the oil is changed on the spot, no deposit is paid. Unclaimed deposits could remain at the retailer. The deposit creates an incentive for oil user to return the used oil. Having used oil in larger quantities will reduce costs for collection and transport so the supply of used oil will shift down on its right side downward to the right. The level of the deposit could be \$0.60-\$0.80 per liter. From this amount, 25% could cover expenditures for maintaining the collection point.

*Obligation of lube oil retailers to have collection points.* By introducing the requirement that retailers would provide collecting and exchange points, the costs of gathering used oil would be decreased. There are two logical exchange points for used oil: at the selling points for motor oil bought by "do-it-yourself" oil changers and at the garages, repair shops and gas stations where usually the oil is changed. In both cases supplementary costs will occur for lube oil sellers. To cover this extra cost a price increase of the lube oil could be introduced or a payment for exchanging the used oil proposed. A requirement to take back used oil would impose costs on the sellers of new oil. To compensate for this cost, this proposal envisions compensation adequate to recoup these costs. Since used oil generators are the potential polluters, they should pay for this service, possibly in the form of a surcharge on the price of new lubricating oils. Collectors and haulers of used oil should be paid for their services. In addition, strict regulations should be introduced to cover a range of issues: dumping, labeling, mixing of used oil with chemicals, penalties and fines for violating the regulations.

*Tax - Subsidy System.* The options for a Tax - Subsidy might be a 15 to 20% tax on new oil sales. Every consumer of new oil would pay the tax since used oil currently is being disposed of in an environmentally unacceptable fashion. The subsidy would be, for approved uses of used oil, about \$0.05 - \$0.10 per liter. Based on international experience, such an amount would be sufficient to cover

the costs of proper management and disposal. The tax on sales of lube oils would have little influence on sales (incentive effect) but money collected would be significant. Revenues collected from producers and importers of lube oil could be used to subsidize links and activities in the collection chain where used oil has negative value. Remaining funds could be used for additional collection facilities and for public education. The main advantage of this approach is the fact that money would be provided to support a nationwide policy. At the same time no budget resources would be involved and jobs will be created. The disadvantage of this scheme would be related to the difficulty of adjusting the level of the tax with the changes in oil price. If the subsidy is too high supplementary incentives will be created for investing in new business in the field, thereby creating excess capacity.

## **Results**

At the close of the Task Order, government decisions on all three of these waste recovery issues were under discussion. Beginning in November 1999 a twinning project with German authorities commenced in order to improve the waste management policy in Romania, with the potential to focus on these waste recovery issues, although the priority was the development of regulations under the Waste Law and building institutional capacity. The Ministry of Industry and Commerce appeared likely to assume a greater leadership role in steering the decisions on waste recovery toward approval and implementation.

## **Chapter 6**

### **Conclusions**

After several difficult months of delays related to reorganization of MWFEP, including changes in management and staff of the Ministry, EPIQ was successful in implementing and completing all elements of the final work plan. With the exception of the work on water tariffs, all activities resulted in either the adoption and implementation of legislation (Law, Government Decision, MWFEP Order) or the preparation of a draft. During 1999, seven pieces of legislation, for which EPIQ had a substantial role in development, were approved by the government. An additional six pieces of legislation were subsequently approved in 2000, with another six drafted and under discussion in the government.

While a significant share of EPIQ project activity was directly linked to Romania's effort to approximate legislation with the laws and directives of the European Union, EPIQ also attempted to focus some of its work on issues such as sustainable finance and the use of economic instruments. These efforts represented, potentially, the foundation for greater emphasis on the challenges ahead for Romania in meeting compliance schedules, developing and supporting with financial resources the institutional capacity at the national and local levels needed for implementation, and funding investments to improve the quality of the environment. In all of EPIQ's activities, analyses focused on economic issues and linkages to macroeconomic and fiscal policy, privatization, industrial restructuring, and urban development. In addition, by encouraging MWFEP to expand the participation of working groups beyond the traditional ministerial boundary, it was possible to bring a diverse set of viewpoints into the discussion of environmental policy. However, throughout the duration of the Task Order, EPIQ (and USAID) continued to press for even broader participation in working groups to reflect all stakeholders through the participation of EPAs, industry, and NGOs.

Finally, the EPIQ program represented a new style of cooperation in MWFEP, with a core staff of Romanian experts in the EPIQ team partnered with counterparts in the Ministry and foreign experts utilized strategically to complement the local team. The Ministry appears to have been keenly receptive to this style of work. In addition, the approach has allowed USAID to cost-effectively support a large number of activities and contributed positively to the development of local capacity and expertise that will be valuable in supporting MWFEP as it continues to develop, improve and implement its environmental policies.